Adsorption-complex-forming Chromatographic Method

S/030/60/000/010/005/018
B021/B058

method. The separation of Nb and Ta in columns with coal and tannin at 100°C is mentioned as an example. Finally, it is stated that the adsorption-complex-forming chromatographic method permits to establish columns with extraordinary selectivity through simple procedures and by means of usual chemical reagents and cheap, accessible adsorbents. Not only complex-forming reactions but also other chemical reactions can be used in a similar way. It is, however, necessary that the materials to be separated show a different reactivity toward the given reagents and that the compounds formed remain solidly bonded to the surface of the adsorbents. This principle can also be used for carrying out some organic reactions and the separation of their products. There is 1 Soviet reference.

Card 2/2

GURVICH, A. M.; KATOMINA, R. V.

Some problems in the physics of an X-ray screen. Nov. med. tekh. no.1:47-59 '61. (MIRA 14:12)

1. Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut.

(X RAYS—APPARATUS AND SUPPLIES)

GURVICH, A.M.; DUBOVITSKAYA, B.B.

Lead-baryte amplifying screen. Nov. med. tekh. no.5[61-67 1962.
(MIRA 17:6)

1. Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut i Khimiko-farmatsevticheskiy zavod imeni N.A. Semashko.

S/081/62/000/014/019/039
B166/B144

AUTHORS: Gurvich, A. M., Dubovitskaya, B. B.

TITLE: Lead-barite intensifying screens

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 14, 1962, 387-388, abstract 14K128 (Novosti med. tekhn., no. 5, 1961, 61 - 67)

TEXT: X-ray intensifying screen phosphors consist of a (Ba, Pb)SO_4 phosphor calcined at [illegible] - 1000°C with a flux consisting of a mixture of sodium sulfate and bisulfate; the sulfate taken in this case being ≤60% of the weight of the finished phosphor. The quantity of bisulfate taken is 4 - 8% of the weight of blend (equal to 10-20% of the weight of sulfate). The mixed flux is got by adding a calculated quantity of pure H_2SO_4 to a chromatographically purified solution of Na_2SO_4. The phosphor screen thus prepared has 25-30% higher glow intensity than ordinary standard screens; in this case, with voltages of the order of 80 - 100 kv on the X-ray tube the screen enables the exposure to be almost halved. 17 references.

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Lead-barite intensifying ... S/081/62/000/014/019/039
B166/B144

[Abstracter's note: Complete translation.]

Card 2/2

20849

9.4160 (also 1137, 1395)
24.3500 1155, 1160, 1138

S/048/61/025/003/038/047
B104/B203

AUTHOR: Gurvich, A. M.

TITLE: Effect of fluxing agents on the optical properties of zinc sulfide luminophores

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 3, 1961, 411-414

TEXT: This paper was read at the 9th Conference on Luminescence (Crystal Phosphors) in Kiyev, June 20-25, 1960. Chlorides of alkali and alkaline-earth metals are commonly used today as fluxing agents. Zinc chloride and chlorides of metals introduced as activators are formed in the heat treatment. Chlorides of heavy metals (heavier than alkali and alkaline-earth metals) are formed by annealing with atmospheric oxygen. An analysis conducted by the author showed the following molar composition for the phase of the fluxing agent after 20-min heat treatment of ZnS with 5% by weight of NaCl at 1100°C: 0.81 NaCl, 0.07 $ZnCl_2$, and 0.12 Na_2SO_4. The interaction of sulfides with halogen fluxing agents does not only effect

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"corrosion" of the sulfide surface, but also formation of activator chlorides, which facilitates penetration of activators in the ZnS lattice. The low melting point of silver, copper, and zinc chlorides, as compared with the corresponding sulfides, should be of importance here. As, for instance AgCl and CuCl are formed at comparatively low temperatures (about 300°C), a strong influence is exerted by time and temperature, type and concentration of the fluxing agent on the luminescence of a ZnS-Ag luminophore. Table 1 gives respective data. In some ZnS luminophores, $MgCl_2$ which is transformed to MgO within the first few minutes of the heat treatment, also has a strong effect on intensity and spectral composition of luminescence. On the basis of a thermodynamic analysis, the following process is established: $MgCl_2 + ZnS = MgS + ZnCl_2$. MgS is dissolved in ZnS until reaching a concentration of 0.6 - 0.7 mole%. The small dimension of the Mg^{++} ion facilitates penetration in the ZnS lattice. According to the above-mentioned processes, oxygen is only required for the heat treatment if it helps to form zinc chloride, copper chloride, or silver chloride which can easily enter the ZnS lattice. Therefore, no blue luminescence is formed in the heat treatment of

of ZnS(NaCl) in oxygen-free atmosphere. Finally, it is pointed out that the solubility of chlorides of heavy metals (activators, zinc, cadmium) in the fluxing agent has a strong influence on their concentration in the basic substance. To prevent $ZnCl_2$ evaporation, sodium chloride is added which increases the brightness of the luminophore. The author thanks T. A. Sokolova for her assistance in the work. There are 2 figures, 1 table, and 18 references: 11 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut Ministerstva zdravookhraneniya RSFSR (State Scientific Roentgen-radiological Research Institute of the Ministry of Health of the RSFSR)

22173

S/048/61/025/004/022/048
B104/B201

24,3500

AUTHORS: Gurvich, A. M. and Katomina, R. V.

TITLE: Choice of fluorescent material for Roentgen screens

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 4, 1961, 506-508

TEXT: The present paper has been read at the 9th Conference on Luminescence (Crystal Phosphors), Kiyev, June 20-25, 1960. The authors studied the luminescence intensity of Roentgen screens prepared from the principal commercial Roentgen luminophores as dependent upon the wavelength of X-rays in the range 0.11 - 1.8 A. Measurements were made with a photoelectric photometer with antimony-cesium photocells from the side facing the source of radiation. The experimental conditions have been described in a previous paper (Ref. 1: Gurvich A. M. et al. Novosti med. tekhniki, No. 1, 47 (1961)). Results are collected in Figs. 1 and 2, and in the table. The conclusion is drawn from them that the (Zn,Cd)S-Ag luminophore is best suited for electron-optical amplifiers of X-ray pictures. Above 30 kv_{eff} the advantage offered by (Zn,Cd)S-Ag luminophores as confronted with

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S/048/61/025/004/022/048
B104/B201

Choice of fluorescent...

ZnS-Ag screens grows with an increase of E. If a Sb-Cs photocathode is used as pick-up of screen radiation, the optimum CdS content in the (Zn,Cd)S-Ag compound will be 40 % of the total sulfide weight. For fluoroscopic screens, in which a panchromatic Pφ-3 (RF-3) film serves as pick-up of radiation, the optimum CdS content is between 40 and 50 %. There are 2 figures, 1 table, and 4 Soviet-bloc references.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy rentgenoradiologicheskiy institut Ministerstva zdravookhraneniya RSFSR (State Scientific Research Institute of roentgenology and radiology Ministry of Hygiene RSFSR)

Legend to Fig. 1: 1a) relative luminescence intensity of Roentgen screens (70 mg cm^{-2}) as a function of hardness of X-radiation. 1) $CaWO_4$ (Na_2HPO_4) (Standard); 2) $CaWO_4$ ($CaCl_2$); 3) (Ba-Pb)SO_4 (Na_2SO_4, $NaHSO_4$); 4) cub. ZnS-0.02 % Ag($MgCl_2$ NaCl); 5) hex. 54ZnS·46CdS-0.01Ag(NaCl); 1б) intensity ratio between luminescence of ZnS-0.02 % Ag screen and (Zn,Cd)S-Ag screen as a function of hardness of X-radiation.

ACCESSION NR: AR4032165 S/0058/64/000/002/A046/A046

SOURCE: Ref. zh. Fiz., Abs. 2A388

AUTHORS: Gurvich, A. M.; Krongauz, A. N.; Lyapidevskiy, V. K.; Mandel'tsvayg, Yu. B.; Nikiforova, A. P.; Popov, V. I.; Titov, A. A.

TITLE: Comparative dosimetric characteristics of single crystals of cadmium sulfide

CITED SOURCE: Tr. Vses. n.-i. in-ta med. instrumentov i oborud., no. 5, 1962, 40-51

TOPIC TAGS: cadmium sulfide, single crystal cadmium sulfide, dosimetric characteristics, therapeutic x ray monitoring, radiation dose power, roentgen ampere characteristic, variation with hardness

TRANSLATION: The dosimetric characteristic of CdS single crystals, as applied to problems of x-ray therapy, were investigated. The

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ACCESSION NR: AR4032165

crystals used were grown either (a) by sublimation of luminor CdS by the Grillaud method (Group I) or (b) by sublimation of luminor CdS in a nitrogen jet (Group II). Crystals of the first group were activated with indium or gallium, and those of the second group with Cl or with AgCl, with a small amount of Zn introduced. The investigations were carried out with x-ray equipment RUM-7 ("soft"radiation, tube voltage 20--60 kV maximum) and RUM-3 ("hard" radiation, 100--200 kV maximum). The radiation dose power in air was measured with an ionization dosimeter. The sensitivity of crystals of Group I was 7--264 μA/r/min, while those of group II occupied an intermediate position. A strictly linear roentgen-ampere characteristic was possessed by the least sensitive crystals. The "variation with hardness" was measured for the investigated crystals and the corresponding theoretical curve calculated. The results of the measurements and of the calculations are in satisfactory agreement in the region of strong absorption. In the region of weak absorption, the experimental "variation with hardness" is lower than the calcu-

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ACCESSION NR: AR4032165

lated value, owing to the inhomogeneity of the employed radiation. It is concluded that in the limited energy range used in x-ray therapy (at a generation voltage of 150--200 kV maximum), the investigated single crystals, particularly those of the first group, can be used successfully as detectors in clinical x-ray dosimeters. Yu. Mandel'tsveyg.

DATE ACQ: 31Mar64 SUB CODE: PH, SD ENCL: 00

Card 3/3

24 2500

40043
S/076/62/036/008/001/011
B101/B144

AUTHOR: Gurvich, A. M. (Moscow)

TITLE: Effect of flux on the formation of luminescence centers in zinc sulfide luminophores

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 8, 1962, 1678 - 1686

TEXT: This report was delivered at the IX Soveshchaniye po lyuminostsentsii (9th Conference on Luminescence), Kiyev, June 1960. The specific effect of $MgCl_2$ and Cu on the luminescence of zinc sulfide luminophores (LPh) was studied. LPh with 7% $MgCl_2$ showed twice the luminescence of LPh with 7% $BaCl_2$ or $CaCl_2$. According to Debye patterns, however, $MgCl_2$ had no specific effect on the transformation of sphalerite into wurtzite. Analyses showed that more than 80% of $MgCl_2$ had converted into MgO. A direct addition of MgO to a ZnS(NaCl) LPh did not affect luminescence. It is therefore assumed that Mg is incorporated in the LPh lattice as MgS, which forms at high temperature by hydrolysis and oxidation of $MgCl_2$. A volume

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Effect of flux on the formation...

compensation (F. A. Kröger, J. A. M. Dikhoff, J. Electrochem. Soc., 99, 144, 1952) takes place: The smaller Mg^{2+} ions facilitate the incorporation of co-activators (Cl^-) in the ZnS lattice and prevent the association of oppositely charged defects. ZnS(0.05Cu)(5NaCl) showed a weak blue band (λ_{max}~450µm) and an intensive green band (λ_{max}~520µm) after 2 min thermal treatment. After 20 min, the intensity of the two bands had inverted. According to J. W. Strange (Proc. Phys. Soc., 55, 364, 1943) it is assumed that Cu_2S is transformed by the chloride into CuCl in the presence of O_2 at the first stage of thermal treatment. CuCl readily enters the ZnS lattice and causes the green luminescence band. The reaction $2CuCl + ZnS = Cu_2S + ZnCl_2$ reproduces Cu_2S which dissolves in ZnS; its Cu^+ ion pair causes the blue band. No CuCl is formed in the absence of O_2 since a conversion of NaCl to Na_2S is energetically unfavorable. In the presence of $MgCl_2$, the transition from green to blue is delayed because of the high partial pressure of the resulting HCl. Contrary to F. A. Kröger et al. (Physica, 15, 990, 1949), the transition from blue to green II at increased Cu content

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is not explained by formation of quenching centers from molecular-disperse Cu_2S but from dimers and polymers of Cu_2S which act like associated molecules in solutions of luminescent dyes. There are 5 figures and 3 tables.

ASSOCIATION: Rentgeno-radiologicheskiy institut (Institute of Roentgenology and Radiology)

SUBMITTED: October 20, 1960

S/051/62/012/005/019/021
E075/E136

24.3500

AUTHOR: Gurvich, A.M.

TITLE: New luminophors - cadmium and zinc chlorides activated by sulphides

PERIODICAL: Optika i spektroskopiya, v.12, no.5, 1962, 642-644

TEXT: This paper was presented at the Seminar on luminescence at the Fizicheskiy institut imeni P.N. Lebedeva AN SSSR (Physics Institute imeni P.N. Lebedev, AS USSR) on 11th October, 1961.
It was discovered that Zn and Cd sulphides can activate the chlorides which can then become strongly luminescent after excitation by ultraviolet light. For $CdCl_2$-CdS system the optimum content of CdS is 3% of the weight of $CdCl_2$. The luminophor produces a yellow-orange luminescence. Addition of $ZnCl_2$ shifts the luminescence band to the short wave region of the spectrum. This gives a number of luminophors with different glow colours. In particular, for the ratio of $CdCl_2$: $ZnCl_2$ of about 4 : 1 by weight, the colour of the glow was white with

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a shade of blue. The increase in Zn content narrows the luminescent band and intensifies after-glow, which is especially marked for $ZnCl_2$ concentrations of 4-5%. The brightness of luminescence of powdered $CdCl_2$-ZnS (3%) luminophor after excitation with Hg line at 365 millimicrons is about 35% of the luminescence brightness of the related 60 ZnS · 40 CdS-Cl (1100 °C) luminophor, which is capable of giving the strongest glow emission.
There are 2 figures.

SUBMITTED: October 16, 1961

S/196/63/000/001/017/035
E194/E155

AUTHOR: Gurvich, A.M.

TITLE: A qualitative criterion of spectral matching and its use in lighting calculations

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.1, 1963, 6, abstract 1 V 28. (Svetotekhnika, no.9, 1962, 17-20)

TEXT: The lighting problem of matching the spectral characteristics of radiation source and receiver is considered. Expressions are derived for calculating K, the coefficient of spectral matching, which defines the value of the relative spectral distribution of radiant energy and spectral sensitivity of the receiver. The choice of a source of optimum radiation for the given receiver, and the inverse problem of selecting a receiver of the optimum spectral sensitivity for the given radiation, are discussed. It is noted that in making lighting calculations, the spectral matching coefficient can often be used as an averaging device to compare the effectiveness of radiation on a given

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A qualitative criterion of spectral... S/196/63/000/001/017/035
E194/E155

receiver rather than the eye or other reference receiver.
6 references.

ASSOCIATION: Gosudarstvennyy rentgeno-radiologich. in-t
(State Roentgenological and Radiological Institute)

[Abstractor's note: Complete translation.]

Card 2/2

GURVICH, A.M.; TOLOVA, S.V.

Some changes in the structure of the respiratory act during the agonal process. Pat. fiziol. i eksp. terap. 8 no.1:24-29 Ja-F '64. (MIRA 18:2)

1. Laboratoriya eksperimental'noy fiziologii po ozhivleniyu organizma (zav.- prof. V.A. Negovskiy) AMN SSSR, Moskva.

ACCESSION NR: AP4042991 S/0051/64/017/001/0137/0139

AUTHORS: Gurvich, A. M.; Nikiforova, A. P.; Il'ina, M. A.

TITLE: Luminescence in the cadmium sulfate-sulfide system

SOURCE: Optika i spektroskopiya, v. 17, no. 1, 1964, 137-139

TOPIC TAGS: luminor, luminescence research, spectrum luminescence, cadmium sulfide, excitation spectrum, recombination luminescence

ABSTRACT: Heating of nonluminescent CdS single crystals in $CdSO_4$ powder at 700° in a nitrogen atmosphere causes the place of contact between the cadmium sulfate powder and the single crystals to exhibit yellow-green photoluminescence. A luminor with similar glow (λ_{max} = 530 = 540 nm) was also observed when a mixture of $CdSO_4$ powder with a small amount (2--10%) of CdS powder was heated at 700--750°. It is shown that the only cause of this luminescence

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ACCESSION NR: AP4042991

can be the presence of the CdS. Luminors of this type are produced only in a narrow temperature range 700--750°, and have at room temperature a glow of much shorter wavelength than ordinary phosphors based on CdS. Unlike halogenide luminors activated with sulfides, the $CdSO_4$.CdO-CdS system exhibits attributes of recombination luminescence. The excitation spectrum consists of a broad band with two maxima, and the intensity of the luminescence shows some temperature dependence. The luminor is compared with others in which cadmium sulfide serves as the emitting substance. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 19Jul63

ENCL: 01

SUB CODE: OP, IC NR REF SOV: 007 OTHER: 002

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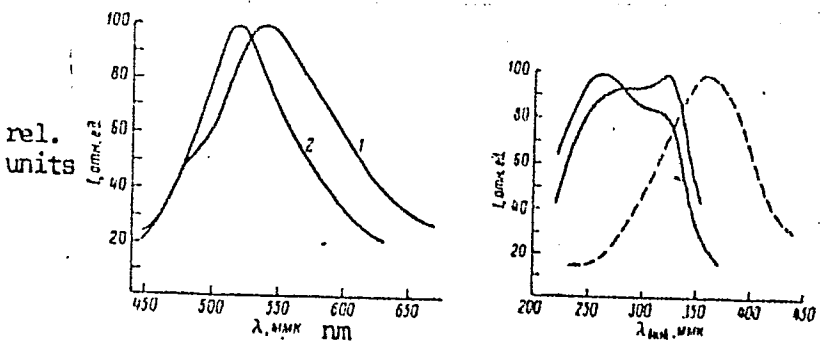
ACCESSION NR: AP4042991

ENCLOSURE: 01



Left - spectral composition of radiation from $CdSO_4$.CdO-10% CdS luminor excited by 365 nm mercury line. 1 - room temperature, 2 - liquid nitrogen temperature

Right - excitation spectrum of two samples of $CdSO_4$.CdO.CdS luminor. The dashed line shows, for comparison, the spectrum of the $CdCl_2$-3%CdS luminor

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L 16287-65 EWA(k)/EWT(l)/EWT(m)/EEC(t)/EWP(t)/EEC(b)-2/EWP(b) EJP(c)/ ESD(t)/ESD(gs)/AS(mp)-2/APGC(b) JD

ACCESSION NR: AP5000549 S/0051/64/017/006/0893/0900

AUTHORS: Gurvich, A. M.; Il'ina, M. A.

TITLE: Comparative investigation of x-ray luminescence and photoluminescence of ZnS-Cu luminors

SOURCE: Optika i spektroskopiya, v. 17, no. 6, 1964, 893-900

TOPIC TAGS: zinc sulfide optic material, luminor, x ray luminescence, photoluminescence

ABSTRACT: The purpose of the investigation was to explain some puzzling peculiarities in x-ray luminescence of crystal phosphors. The ZnS-Cu luminors investigated were produced by two methods: with limited air supply, using a procedure described earlier (ZhFKh, v. 36, 1678, 1962) and in hydrogen, using a roasting technique similar to that described by A. L. Smith (Trans. Electrochem. Soc. v. 93, 324, 1948). The luminescence was excited with a PRK-4 lamp

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L 16287-65
ACCESSION NR: AP5000549

with a filter separating the 365 nm line, a BUV-15 lamp with filter separating the 254 nm line, and x-rays. The energy distribution in the radiation spectrum was measured with a DM-2 monochromator and an FEU-32 photomultiplier. The excitation spectra were measured with an FF-4 spectrophotometer. The luminor prepared in hydrogen had bright blue photoluminescence when excited with the 365 nm Hg line, due to the presence of copper. The two types of luminors showed opposite variations of the spectral composition of radiation on going from excitation with ultraviolet to excitation with x-rays. The blue band was best produced by x-rays in the luminor roasted in air and by ultraviolet rays in the second type. This is attributed to the joint influence of two factors: first, that the green band is easier to excite when the exciting radiation is absorbed by the ZnS lattice than by the blue centers, and second, that the excitation density is not uniform over the spectrum. It is concluded on the basis of an analysis of the results that the method of producing the luminor is of great importance in studies

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L 16287-65
ACCESSION NR: AP5000549

2

of optical properties of zinc-sulfide luminors. "We thank T. A. Sokolova for help in preparing the luminors and S. Ya. Gutner for investigating the spectral composition of the luminors excited with cathode rays." Orig. art. has: 6 figures.

ASSOCIATION: None

SUBMITTED: 19Jul63 ENCL: 00

SUB CODE: OP, SS NR REF SOV: 006 OTHER: 006

Card 3/3

GURVICH, A.M.

Role of the chlorinating - gassing of sulfides in the f[illegible] of blue luminescence centers of "self-activated" zinc sulfide luminophors. Zhur. fiz. khim. 38 no.2:455-459 F '64.
(M.RA 17:3)

1. Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut.

ACCESSION NR: AP4039615 S/0076/64/038/005/1111/1117

AUTHOR: Gurvich, A. M. (Moscow)

TITLE: Chemical nature and interconversion of "blue" and "green" luminescence centers in ZnS-Cu phosphors

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 5, 1964, 1111-1117

TOPIC TAGS: phosphor, zinc sulfide-copper phosphor, blue luminescence, green luminescence, self-activated phosphor, luminescence interconversion

ABSTRACT: Interconversion of the "blue" and "green" luminescence centers in ZnS-Cu phosphors has been studied to contribute to the solution of the controversy about the chemical nature of the blue luminescence. Spectral distribution of the luminescence intensity from specimens heat-treated in air or in hydrogen showed that the chemical nature of the defects responsible for the formation of "blue" luminescence centers is different in the case of "self-activated" and Cu-activated ZnS phosphors. Heating in the air ZnS-Cu phosphors with high Cu content at relatively low temperature (200-300 C) leads to the conclusion that equilibrium interconversion of "blue" and "green" centers takes place. It was assumed that disso-

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ACCESSION NR: AP4039615

lution of Cu_2S in ZnS, accompanied by formation of pairs of Cu atoms located in adjacent nodes of the lattice is responsible for the blue luminescence. Dissociation of such pairs of Cu atoms leads to the formation of green luminescence centers. Orig. art. has: 4 formulas, 3 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 04Mar63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: GP, GC NO REF SOV: 004 OTHER: 012

Card 2/2

GAL'PERIN, Ye.I., GURVICH, A.M.

Phase of variable composition in the system Zn - S.
Zhur. neorg. khim. 9 no.7:1767-1768 Jl '64.
(MIRA 17:9)

1. Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut.

L 49267-65 EWT(1)/EWT(m)/EPR/EWP(t)/EWP(b) Pa-4/Pt-4 IJP(c) JD

ACCESSION NR: AP5009534 S/0048/65/029/003/0507/0511

AUTHOR: Gurvich, A.M.; Katomina, R.V.; Nikiforova, A.P.

TITLE: On the chemical nature of the luminescence centers in zinc sulfide and cadmium sulfide luminophors /Report, 12th Conference on Luminescence held in L'vov 30 Jan-5 Feb 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 3, 1965, 507-511

TOPIC TAGS: luminescence, zinc compound, cadmium compound, sulfide, chlorine, copper, oxygen, aluminum

ABSTRACT: On the basis of the assumption that common ZnS and CdS luminophors are solid solutions of a compound of the activator in the sulfide, the authors have attempted in certain cases to determine the activator compound involved by examining the influence of the synthesis conditions on the resulting luminescence. ZnS and CdS luminophors were synthesized in evacuated sealed quartz tubes. It was found that ZnS:Cl luminophors luminesced strongly in the blue only when $ZnCl_2$ was present. The presence of oxygen inhibited the luminescence, and it is concluded that the most advantageous conditions for the preparation of ZnS:Cl luminophors are

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L 49267-65

ACCESSION NR: AP5009334

those in which $ZnCl_2$ is formed and penetrates into the lattice without the participation of oxygen. The red luminescence of CdS:Cl luminophors was obtained only when the synthesis included heating in the presence of $CdCl_2$ vapor. The blue luminescence of ZnS:Cu was obtained only when Cl was present during the synthesis and is ascribed to ZnS:CuCl. ZnS:Cu:Al luminophors synthesized under chlorine-free conditions, however, also show the same blue luminescence. The similarities and differences between ZnS:CuCl and ZnS:Cu:Al (chlorine-free) luminophors are discussed at some length and are illustrated with luminescence spectra, but no general conclusions appear to emerge. "We express our gratitude to A.Ya.Gutner and M.A.Meyerov for measuring the spectral composition of the luminescence of the luminophors under cathode ray excitation." Orig. art. has: 1 figure and 2 tables.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut (State Scientific Research X-Ray Radiological Institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: OP, SS

NR REF SOV: 013 OTHER: 009

Card 2/3

GURVICH, A.M. (Moskva); KRONGAUZ, A.V. (Moskva); NI[illegible] (Moskva); TITOV, A.A. (Moskva)

Activation of single crystals on a CdS basis and study of their photoelectric properties. Trudy TSentr. nauch.-issl. inst. radiotekh. i rad. 11 no.1:286-299 '64. (MIRA 18:11)

GURVICH, A.M.

Chemical nature and mutual conversions of "blue" and "green" luminescence centers in ZnS-Cu luminophors. Zhur. fiz. khim. 38 no.5:1111-1117 My '64. (MIRA 18:12)

1. Submitted March 4, 1963.

GURVICH, A.M.

Heterogenicity of slow waves of the delta-range occurring in anoxic and postanoxic states. Fiziol. zhur. 51 no.10: 1210-1219 O '65. (MIRA 18:12)

1. Laboratoriya eksperimental'noy fiziologii po ozhivleniyu organizma AMN SSSR, Moskva. Submitted April 2, 1964.

L 23687-66 EWT(1) SCTB DD

ACC NR: AP6004833 SOURCE CODE: UR/0239/65/051/010/1210/1219

24
B

AUTHOR: Gurvich, A. M.

ORG: Laboratory of Experimental Physiology of Reanimation, AMN SSSR, Moscow (Laboratoriya eksperimental'noy fiziologii po ozhivleniyu organizma AMN SSSR)

TITLE: The heterogenicity of slow waves of the delta range observed in anoxia and post anoxic states

SOURCE: Fiziologicheskiy zhurnal SSSR, v. 51, no. 10, 1965, 1210-1219

TOPIC TAGS: anoxia, experiment animal, EEG, cardiovascular system, brain

ABSTRACT: In tests conducted in 28 dogs with electrodes in their brains, the dying state was obtained by bleeding, application of an electric current to the heart to cause fibrillation, or by asphyxia. After blood circulation had stopped for 0-12 minutes the dogs were revived by epinephrine, artificial respiration and heart massage. Two types of slow delta waves were observed in the EEG in the anoxic and post anoxic state: (1) polymorphic delta waves at 1-3 vibrations/sec, asynchronous in cortical areas and subcortical centers; and (2) standard slow complexes consisting usually of an initial negative and secondary

Card 1/2 UDC: 612.822.3+612.822.6

positive phase, widely distributed in the large brain hemispheres and synchronous in its various sections. The polymorph waves in the EEG result from stimulation of cortical nerve elements, seen particularly in their relation to potentials of the primary response type and their appearance together with local oscillatory outbreaks (over 20-30 oscillations/sec). The standard slow complexes (SSC) derive from the subcortical pacemaker, without cortex participation. The pacemaker SSC and the systems generating asynchronous delta waves have different sensitivity to the hypoxia effect, as a result of which the SSC may be detected only under optimal conditions of dying and revival. Due to synchronicity of the SSC their registration on the EEG requires monopolar leads. Orig. art. has: 5 figures.

SUB CODE: 06/ SUBM DATE: 02Apr64/ ORIG REF: 002/ OTH REF: 011

L 26490-66 EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6013071 SOURCE CODE: UR/0048/66/030/004/0644/0648

AUTHOR: Gurvich, A. M.

ORG: State Scientific Research Roentgeno-radiological Institute (Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut)

TITLE: Investigation of inter-conversion of luminescence centers in zinc sulfide phosphors /Report, Fourteenth Conference on Luminescence held in Riga, 16-23 September 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 4, 1966, 644-648

TOPIC TAGS: luminescence center, crystal phosphor, zinc sulfide, crystal dislocation

ABSTRACT: It has been shown in earlier studies by the author and by non-Soviet investigators that as a result of heating of ZnS:Cu phosphors at relatively low temperatures (100 to 350°C) there occurs in the case of high activator concentrations mutual transformation (inter-conversion) of different luminescence centers; the process is reversible in some cases and irreversible in others. Although most of the present experiments were carried out with ZnS:Cu, some experiments were performed with ZnS:Ag, and it was found that similar inter-conversion occurs in this phosphor as well. In the experiments small batches of the phosphor were loaded into a vertical quartz tube heated to the desired temperature and then the phosphor was dumped onto a cool surface.

Card 1/2

L 26490-66

ACC NR: AP6013071

The kinetics of the blue-green, yellow-green and red-yellow conversion processes are characterized by curves plotted in terms of relative intensities versus the heating time at different temperatures. The data indicate that dislocations play an important role. The various effects observed are described and the possible mechanisms are discussed. The conversions evinced in the case of ZnS:Ag are analogous to those observed for ZnS:Cu, but naturally are not identical: for example, owing to the larger size of Ag^+ ions, as compared to Cu^+, higher temperatures are required for effective dissociation of complex centers. I express my gratitude to T.A.Sokolova for assistance in the work. Footnote: M.A.Il'ina participated in the spectroscopic part of the study, and this part will be published separately. Orig. art. has: 5 formulas and 3 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 004/ OTH REF: 009

Card 2/2

L 26489-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6013072 SOURCE CODE: UR/0048/66/030/004/0649/0653

AUTHOR: Gurvich, A. M.; Il'ina, M. A.; Katomina, R. V.; Nikiforova, A. P.

ORG: State Scientific Research Roentgeno-radiological Institute (Gosudarstvennyy nauchno-issledovatel'skiy rentgeno-radiologicheskiy institut)

TITLE: Activation of zinc and cadmium sulfides by halogens and Group III elements /Report, Conference on Luminescence held in Riga, 16-23 September 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 4, 1966, 649-653

TOPIC TAGS: crystal phosphor, zinc sulfide, cadmium sulfide, luminescence, luminescence spectrum, forbidden band

ABSTRACT: The work was concerned with investigation of activation of zinc and cadmium sulfides by elements that are usually termed coactivators; however, when the said element is the only real impurity present and is responsible for distinctive luminescence it is justifiable to call it an activator in its own right. To clarify the role of the heating medium there were sintered batches of equal amounts of ZnS and CdS with 5% NaCl, all at 950°C but in different gases. The luminescence spectra of the products under 365 mμ excitation at -180° exhibit all three characteristic bands, but with greatly varying relative intensities, depending on the medium. Potassium chloride and the alkali bromides and iodides yielded similar results. The formation of $ZnCl_2$ (or $CdCl_2$) from NaCl in the sulfide is discussed, as is the solubility of $ZnCl_2$ in ZnS.

Card 1/2

L 26489-66

ACC NR: AP6013072

The technology of activation of ZnS with aluminum is described. Like aluminum, gallium and indium can be introduced into zinc sulfide either in metallic form (in this case it is desirable to have some excess sulfur in the sulfide) or in the form of a suitable compound, such as the nitrate. In activating powdered CdS with indium it was found that in the case of heating dechlorinated (with H_2S) CdS with metallic In in a sealed quartz tube at 700° there is obtained a phosphor with bright green luminescence under stimulation at room temperature by the 365 mμ line of Hg. Investigation showed the presence of one narrow band (half-width 38 mμ) at 520 mμ, i.e., close to the position of the "edge" band. Upon cooling this band becomes narrower and shifts to the long wavelength side, that is, acquires the position and configuration of the "edge" band. This effect is distinctive, for ordinarily green photoluminescence of CdS is observed only at low temperatures and is evinced in a form of a relatively broad band. It is suggested that in the presence of indium the green centers lodge at special locations in the crystal (possible near the surface), where they not only distort the normal band structure, but also broaden the forbidden band. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 012/ OTH REF: 017

Card 2/2

L 04756-67 EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6025954 SOURCE CODE: UR/0051/66/021/001/0067/0075

AUTHOR: Gurvich, A. M.; Il'ina, M. A.

ORG: none

TITLE: Yellow and red luminescence of ZnS-Cu phosphors in the presence of oxygen

SOURCE: Optika i spektroskopiya, v. 21, no. 1, 1966, 67-75

TOPIC TAGS: phosphor, luminescence research

ABSTRACT: The conditions are described for the production of ZnS-Cu phosphors which have yellow ($\lambda_{max} \approx$ 590 mμ) and red ($\lambda_{max} \approx$ 725-730 mμ) emission bands in the presence of air oxygen. These phosphors are produced by heating green phosphors, formed by quenching in distilled water, to 145-150°C for 10-30 min. It was found that under these conditions neither NaCl nor oxygen interfere with yellow and red luminescence. This method of production of phosphors has a number of advantages over the existing methods: simplicity, reproducibility and intensity of luminescence in the indicated spectral regions. The data show that in this case a typical recombination of *f*-centers takes place. The article considers spectral composition and intensity of luminescence of the above phosphors as a function of the conditions of preparation and excitation. At liquid nitrogen temperatures, the yellow band maximum is at 620 mμ.

UDC: 535.373.1

Card 1/2

L 04756-67

ACC NR: AP6025954

Here, yellow phosphor also exhibits an intense short wavelength emission band consisting of blue and green. As the temperature is increased, the short-wavelength emission band is shifted toward long wavelengths due to the decrease of the intensity of the blue emission band and increase of the fraction of the green band. At -31°C, only the green band is existent. When the temperature is increased from -162°C to 7°C the maximum of the green band is shifted by 17 mμ towards the long wavelenghts. At the same time with increase of the temperature the yellow band moves toward the green band and merges with it at room temperature. When the temperature is increased to -75°C the yellow band maximum is shifted toward the short wavelength region. This shift is not associated with the overlap of the green emission band. Further shift from 600 to 665 mμ is to a large extent affected by the green band. At low temperatures the yellow band is predominant in the emission spectrum of the red phosphor. As the temperature is increased redisribution of energy in favor of the red band takes place. It is concluded that the ground level of the red center occupies a higher position than the ground level of the yellow center, where the latter is in turn higher than the ground level of the green center. The authors express their gratitude to T. A. Sokolova for her help in this work. Orig. art. has: 6 figures, 1 table.

SUB CODE: 20,07/ SUBM DATE: 28Dec64/ ORIG REF: 005/ OTH REF: 013

kh

Card 2/2

GURVICH, A. M.

"The Stability of Blood Clots in Ruptures - a Method of Clinical Research," Khirurgiya, No.5, 1948

Chair of General Surgery, Voronezh Med. Inst.

GURVICH, A.M.

Method of bilateral, one state measurement of arterial pressure. Klin.med., Moskva no.3:90-92 Mr '50. (CIML 19:2)

1. Of the Clinic for Nervous Diseases (Director -- Prof. A.M.Grinshteyn, Active Member of the Academy of Medical Sciences USSR), Second Moscow Medical Institute imeni I.V.Stalin, Moscow.

GURVICH, A. M.

USSR/Medicine - Virus Diseases Mar/Apr 51

"On the Nature of Tick Encephalytis Occurring in the Belorussian SSR," Prof N. I. Grashchenkov, A. M. Gurvich, L. V. Fedorchuk

"Nevropatol i Psikhiat" Vol XX, No 2, pp 36, 37

Ticks of Byelovezhskaya Pushcha contain neurotropic virus which upon introduction into the brain of mice or sheep produces disease resembling Scotch encephalomyelitis. While humans in this area get that type disease, it does not affect sheep under natural conditions. It seems that Ixodes ricinus carries virus which produces

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USSR/Medicine - Virus Diseases Mar/Apr 51
(Contd)

disease of the Scotch type, (meningoencephalitis), while infection from I. persulcatus results in classical type of tick encephalitis similar to that occurring in the Far East (with a poliomyelitic syndrome). Where both species of ticks occur locally, both types of disease are observed. Perhaps virus is same in both cases,but is modified by species of tick which carries it.

186T82

GURVICH, A. M.

Disturbance of the regulation of vascular tonus in cerebral hemiplegia. Zhur. nevr. i psikh. 52 no. 7, 1952.

SO: MLRA, November, 1952.

GURVICH, A.M. (Moscow)

Problem of combatting agonal states and clinical death according to material from the conference dedicated to the pathophysiology and therapy of terminal states in clinical and practical application of first aid. Arkh.pat. 16 no.1:89-92 Ja-Mr '54. (MLRA 7:5)

1. Iz laboratorii eksperimental'noy fiziologii po oshivleniyu organizma Akademii meditsinskikh nauk SSSR (zaveduyushchiy professor V.A.Negovskiy).
(First aid in illness and injury) (Resuscitation)

GURVICH, A.M., kandidat meditsinskikh nauk

Modern foreign technic of artificial blood circulation; review of principal foreign literature. Khirurgiia no.2:73-81 F '55. (MLRA 8:5)

1. Laboratoriya eksperimental'noy fiziologii po ozhivleniya organizma (zav. prof. V.A.Negovskiy) Akademii meditsinskikh nauk SSSR.
(HEART, artificial, review)

GURVICH, A.M.

Role of the retiform formation of the brain stem in the mechanisms of consciousness. Zhur.vys.nerv. deiat. 6 no.3:482-493 My-Je '56. (MIRA 9:11)

1. Institut nauchnoy i tekhnicheskoy informatsii Akademii nauk SSSR.

(BRAIN STEM, physiology,
role of rotiform structure in consciousness (Rus))
(CONSCIOUSNESS,
role of retiform structure of brain stem (Rus))

GURVICH, A.M., kand.med.nauk

Science against death. Biol. v shkole no. 3:79-85 My-Je '58.
(MIRA 11:8)

1. Laboratoriya eksperimental'noy fiziologii po ozhivleniyu organizma, AMN SSSR.
(DEATH, APPARENT)

EXCERPTA MEDICA Sec 2 Vol 12/2 Physiology Feb 59

886. INFLUENCE OF DURATION OF CLINICAL DEATH PRODUCED BY ACUTE HAEMORRHAGE UPON RESTITUTION OF CORTICAL ELECTRICAL ACTIVITY IN DOGS (Russian text) - Gurvich A. M. Lab. of Exp. Physiol. of Resuscitation, Acad. of Med. Scis. USSR, Moscow - FIZIOL. ZH. 1958, 44/5 (424-432) Illus. 6

Restitution of electrical activity of the cerebral cortex was studied in dogs after clinical death of 1 to 5 min. duration, brought about by haemorrhage. Patterns of restitution of electrical activity after protracted periods of clinical death (4-5 min.) were different from those observed after shorter (from 1 to 3.5 min.) periods of clinical death. After protracted periods of clinical death a peculiar phase of activity was observed which was absent after shorter periods of death and consisted in transitory sinusoid oscillations occurring synchronously over the whole surface of the brain, with a frequency of 7-14 per second and a tendency to appear as volleys with the respiratory rhythm. It is suggested that these oscillations may show a disturbance of the relationship between cortical and subcortical levels at early periods of restitution and may serve as an indication of the relative severity of the condition of clinical death. Simonson - Minneapolis, Minn.

NEGOVSKIY, V.A.; GURVICH, A.M.; SOBOLEVA, V.I. (Moskva)

Effect of hypothermia of various depths on the electroencephalogram in dogs during dying from acute hemorrhage with consecutive restoration of life functions. Pat.fiziol. i eksp.terap. 3 no.5:33-41 S-O '59. (MIRA 13:3)

1. Iz laboratorii eksperimental'noy fiziologii po ozhivleniyu organizma (zaveduyushchiy - prof. V.A. Negovskiy) AMN SSSR.

(HYPOTHERMIA, INDUCED eff.)
(ELECTROENCEPHALOGRAPHY)
(RESUSCITATION)
(DEATH)

GURVICH, A.M. (Moskva)

Dynamics of the extinction of cerebrocortical electrical activity during agonal processes induced by hemorrhage in dogs. Arkh.pat. 21 no.2:32-40 '59. (MIRA 12:12)

1. Iz laboratorii eksperimental'noy fiziologii po ozhivleniyu organizma (zav. - prof. V.A. Negovskiy) AMN SSSR.

(ELECTROENCEPHALOGRAPHY,
extinction of cortical electrical processes during agonal states in hemorrh. in dog (Rus))
(CEREBRAL CORTEX, physiol.
same)
(DEATH
same)

GURVICH, A.M.

Respiratory rhythms in the EEG and the role of the respiratory center in the formation of electrical activity in the brain in resuscitation after clinical death. Fiziol. zhur. 46 no. 4:434-442 Ap '60. (MIRA 13:10)

1. From the U.S.S.R. Academy of Medical Sciences, Laboratory of the Experimental Revival Physiology, Moscow.
(RESUSCITATION) (ELECTROENCEPHALOGRAPHY)

ZOLOTOKRYLINA, Ye.S. (Moskva); RYABOVA, N.M. (Moskva); KOLGANOVA, N.S. (Moskva) ; GURVICH, A.M. (Moskva)

Effect of the duration of cardiac massage on the condition of the myocardium and on the restoration of vital activities. Pat. fiziol. i eksp. terap. 6 no.6:22-28 N-D'62 (MIRA 17:3)

1. Iz laboratorii eksperimental'noy fiziologii po ozhivleniyu organizma (zav. - prof. V.A. Negovskiy) AMN SSSR.

GURVICH, A.M.

Reflection of the terminal activity of the respiratory center on the electrogram of the medulla oblongata. Fiziol. zhur. 48 no.1:64-71 Ja '62. (MIRA 15:2)

1. From the Laboratory for Experimental Physiology of Resuscitation U.S.S.R. Academy, Medical Sciences, Moscow.
(MEDULLA OBLONGATA) (DEATH, APPARENT)
(ELECTROENCEPHALOGRAPHY) (RESPIRATION physiol.)

GURVICH, A.M.

Agonal type respiration as reflected by electrograms of medulla oblongata and the respiratory muscles. Dokl. AN SSSR148 no.3:716-719 Ja '63. (MIRA 16:2)

1. Predstavlena akademikom A.N. Bakulevym.
(RESPIRATION) (ELECTROPHYSIOLOGY) (DEATH (BIOLOGY))

SHIKUNOVA, L.G.; FAYNBRUN, O.D.; GURVICH, A.M. (Moskva)

Effect of prolonged cardiac massage on the process of restoration of vital body functions. Pat. fiziol. eksp. ter. 7 no.5: 16-21 S-O'63 (MIRA 17:2)

1. Iz Laboratorii eksperimental'noy fiziologii po ozhivleniyu organizma (zav. - prof. V.A. Negovskiy) AMN SSSR.

GURVICH, A.M.; ZOLOTOKRYLINA, Ye.S.; [illegible]

Extinction and restoration of the cardiac activity and functions of the central nervous system in the fibrillation of the heart in dogs. Eksper. khir. i anest. 9 no.4:94-95 Jl-Ag '64. (MIRA 18:3)

1. Laboratoriya eksperimental'noy fiziologii po ozhivleniyu organizma (zav. - prof. V.A. Negovskiy) AMN SSSR, Moskva.

IL'INA, M.A.; CHERVICH, A.M.

Performance of luminescent screens for X-ray examinations.
Zav. lab. 30 no.5:580-584 '64. (MIRA 17:5)

1. Gosudarstvennyy nauchno-issledovatel'skiy rentgenoradiologicheskiy institut.

ACCESSION NR: AP4019524 S/0076/64/038/002/0456/0459

AUTHOR: Gurvich, A. M.

TITLE: Concerning the role of chlorinating calcination of sulfides in the formation of blue luminescence of "self-activated" zinc sulfide luminophores

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no.2, 1964, 456-459

TOPIC TAGS: zinc sulfide luminophor, chlorinated zinc sulfide, zinc sulfide chlorine calcination, NACl, luminophor

ABSTRACT: While experiments convinced the author that blue luminescence of zinc sulfide is caused by the dissolution in it of zinc chloride formed during calcination of ZnS with NaCl, there remained the unclarified fact that the concentration of chlorine lattice reaches its maximum at 600-700 C and decreases at higher temperatures; but the intensity of luminescence still increases. The purpose of the present work was to clarify this apparent contradiction. Complex experimental studies and even more complex evaluation of same prompted the conclusion that the action of ZnCl alone causes luminescence. Its role is masked by different side reactions.

Card 1/2

ACCESSION NR: AP4019524

ASSOCIATION: Gosudarstvennyy nauchno issledovatel'skiy rentgeno-radiologicheskiy institut (State Scientific Research Institute of X-ray Radiology)

SUBMITTED: 11Jan63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: CH NO REF SOV: 008 OTHER: 009

Card 2/2

ACCESSION NR: AP4029526 S/0239/64/050/004/0407/0417

AUTHOR: Gurvich, A. M.

TITLE: Conditions determining the appearance of certain spindle activity patterns in EEG during restoration of CNS functions after clinical death

SOURCE: Fiziologicheskiy zhurnal SSSR, v. 50, no. 4, 1964, 407-417

TOPIC TAGS: EEG, CNS function restoration, clinical death, spindle activity pattern, amygdaloid nucleus, spindle activity frequency, amygdaloid nucleus activation, spindle activity dependence, barbiturate, respiratory center, reanimation, CNS function restoration prognosis .

ABSTRACT: This study investigates the conditions determining spindle activity patterns in EEG and also the brain areas generating them, the dependence of spindle activity on "nonspecific" brain systems and narcotic substances, and the significance of this activity in prognosis of CNS function restoration. Clinical death was induced in three groups of dogs by progressive hypoxia, exsanguination, and

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ACCESSION NR: AP4029526

heart fibrillation at different periods after electrodes had been fixed in various parts of the brain. Complete stoppage of blood circulation fluctuated from 0 to 10 min in exsanguinated animals and from 3 to 12 min in animals with heart fibrillation. Bioelectric activity was recorded during clinical death and reanimation on a 15 channel Al'var electroencephalograph, and the midbrain was stimulated by a Neyrovar stimulator. Findings show that for all three groups of animals spindle activity patterns appear near the amygdaloid nucleus with a frequency of 6-14/sec and more often 8-12/sec in the early stages of CNS function restoration. This activity is an expression of amygdaloid nucleus activation and is independent of the cortex which acts only as a partial conductor. Spindle activity is affected by impulses from the respiratory center, is inhibited by barbiturates, and is intensified by ether. The appearance of spindle activity patterns is followed by death in most cases and absence of these patterns is followed by complete restoration of CNS functions. This study demonstrates that under certain conditions an activity whose origin is unrelated to the cortex may be recorded on an EEG. Orig. art. has: 5 figures.

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ACCESSION NR: AP4029526

ASSOCIATION: Laboratoriya eksperimental'noy fiziologii po ozhivleniyu organizma AMN SSSR, Moscow (Experimental Physiology Laboratory of Reanimation, AMN SSSR)

SUBMITTED: 22Apr63	DATE ACQ: 29Apr64	ENCL: 00
SUB CODE: AM	NO REF SOV: 003	OTHER: 021

Card 3/3

ACC NR: AP6019659 SOURCE CODE: UR/0368/66/004/006/0564/0568

37
B

AUTHOR: Tombak, M. I.; Gurvich, A. M.

ORG: none

TITLE: Effect of the conditions of producing calcium tungstate on its luminescence [Presented at the XII Conference on Luminescence in L'vov in Jan-Feb 1964]

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 6, 1966, 564-568

TOPIC TAGS: calcium tungstate, luminescence, luminescence center, luminescence spectrum, UV radiation

ABSTRACT: The effect of the conditions of producing $CaWO_4$ on the intensity of its luminescence excitation spectrum, on afterglow, and on the thermoemission was investigated. It is shown that $CaCl_2$ used as a flux not only noticeably increases the intensity of x-ray luminescence of $CaWO_4$ but causes a shift of the edge of the excitation band by 10 mμ toward the long-wave side. This is evidence of the occurrence of new absorption centers of ultraviolet radiation, and since neither other chloride fluxes or CaO have such an effect it is assumed that $CaCl_2$ causes the formation of not impurity defects but structural defects which are responsible for the appearance of these centers. It was found that a lead impurity has a different effect on afterglow of $CaWO_4$ than anion impurities. Lead produces afterglow which does not differ

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ACC NR: AP6019659

in color from luminescence during excitation by x-rays, whereas anion impurities, which are probably arsenate and antimonate, cause the appearance of a green afterglow. This indicates that the anion impurities yield new luminescence centers. The experimental data demonstrate that afterglow is not associated with the formation of radiation defects which were previously thought to be responsible for afterglow. Afterglow caused by radiation defects is observed only after the prolonged exposure of $CaWO_4$ to x-rays. Apparently the centers of luminescence capture are spatially separated and, consequently, prolonged (lasting tens of minutes) afterglow is associated with ionization of appropriate luminescence centers. These centers can be defects of the crystal lattice created by extraneous impurities. The capture centers can be created both by impurities and structural defects, the appearance of which can be associated with the thermal decomposition of $CaWO_4$ or with the introduction of impurities of different valences. The author thanks B. B. Dubovitskaya for help in the preparatory work. Orig. art. has: 3 tables and 2 figures.

SUB CODE: 11,20/ SUBM DATE: 25Jan65/ ORIG REF: 006/ OTH REF: 009

Card 2/2 MLP

GURVICH, Abram Osipovich; SHARKHUN, N.Z., redaktor; OSTRIROV, N.S., tekhnicheskiy redaktor

[Cabinet work with common woods] Stoliarnye beloderevnye raboty. Izd. 2-3, perer. i dop. Moskva, Vsesoiuznoe uchebno-pedagog. Izd-vo, 1954. 346 p. (MLRA 8:8)
(Woodwork)

GURVICH, Abram Osipovich; PIROGOV, N.D., inzhener, redaktor; KRYUGER, Yu.V., redaktor; MEDVEDEV, L.Ya., tekhnicheskiy redaktor.

[Carpentry and preparation of cement molds] Plotnichno- opalubochnye raboty. Izd. 2-oe, perer. i dop. Moskva, Gos. izd-vo lit-ry po stroit. i arkhitekture, 1956. 383 p. (MLRA 9:4)
(Carpentry) (Concrete construction--Formwork)

GURVICH, Abram Osipovich; SLIPCHENKO, F.A., nauchnyy red.; BURMISTROV, G.N., red.; OSTRIROV, N.S., tekhn.red.

[Carpentry] Stoliarnye raboty. Izd.3-e, dop. Moskva, Vses. uchebno-pedagog.izd-vo Trudrezervizdat, 1957. 367 p. (MIRA 10:12)
(Carpentry)

GURVICH, Abram Osipovich; PAKHOMOVA, M.A., red. izd-va; MEDVEDEV, L.Ya., tekhn.red.

[Carpentry and the preparation of concrete forms] Plotnichno-opalubochnye raboty. Izd. 3, perer. i dop. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1958. 359 p. (MIRA 12:1)

(Carpentry) (Concrete construction--Formwork)

GURVICH, Abram Osipovich; SAKHAROV, M.D., nauchn. red.; KYCHEK, T.I., red.; TOKER, A.M., tekhn. red.

[Carpentry] Stoliarnye raboty. Izd.5., perer. i dop. Moskva, Vysshaia shkola, 1964. 607 p. (MIRA 17:1)

GURVICH, A.S. (Moskva, Kutuzovskiy pr., 24, kv.143)

Morphology of the nerve elements of the carotid sinus region in kittens during the first month of life under normal conditions and in oxygen starvation. Arkh.anat.,gist.i embr. 44 no.1:69-76 Ja '63. (MIRA 16:5)

1. Laboratoriya neyrogistologii imeni B.I. Lavrent'yeva (zav. - prof. Ye.K. Plechkova) Instituta normal'noy i patologicheskoy fiziologii AMN SSSR.

(CAROTID SINUS—INNERVATION) (ANOXEMIA)

GURVICH, A. S.

AUTHORS: Volarovich, M.P., and Gurvich, A. S. 49-4-1/23

TITLE: Investigation of the temperature dependence of the dynamic modulus of elasticity of rocks. (Issledovaniye dinamicheskogo modulya uprugosti gornykh porod v zavisimosti ot temperatury).

PERIODICAL: Izvestiya Akademii Nauk, Seriya Geofizicheskaya, 1957, No.4, pp.417-425 (USSR)

ABSTRACT: The authors used an acoustical method, previously used by one of the authors (Ref.8) and based on measuring the resonance frequency of bending oscillations of a rod, for investigating the modulus of elasticity and the damping decrement of glazes and of other ceramic components at temperatures up to 1000°C. A particular method of determining the dynamic shear modulus of rock melts during solidification was described in earlier work of the author and his team (Refs.18,19). The block schematics of the set-up is shown in Fig.1, p.418. The specimens were in the form of rectangular rods of 11 x 0.8 x 0.7 cm and were placed in the horizontal position into a space heated with a temperature controlled electric furnace. The results obtained for a number of rocks, i.e. diabase, basalt, granite, marble, quartzite, sandstone and limestone,

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Investigation of the temperature dependence of the dynamic modulus of elasticity of rocks.

are entered in tables and graphed. The obtained results show that the Young modulus of granite, basalt, diabase, limestone and marble decreases systematically with increasing temperature; for granites the Young modulus drops to one-sixth in the temperature range up to 600°C and then remains almost constant at temperatures up to 900°C. The change in the Young modulus with increasing temperature is less pronounced. In the range of high temperatures, a considerable increase is observed in the decrement of damping of rocks. The Young modulus of glass smolten from basalt and partly crystallised was slightly higher than that of the original basalt; on heating to 800°C it dropped only by about 10%. Sandstone and quartzite show at first a continuous decrease of the Young modulus, up to a temperature of 500°C; this is followed by a sharp decrease with a minimum at 575°C and from then on it begins to increase again. Accordingly, the maximum damping decrement is observed at 575°C. This is attributed to a polymorphous transformation which for quartz takes place at 575°C. On the basis of the data obtained for the Young modulus of rocks, and taking into consideration that the temperature

Investigation of the temperature dependence of the dynamic modulus of elasticity of rocks.

dependence of the Poisson coefficient is relatively small, it is possible to calculate the speed of propagation of elastic, longitudinal waves in rocks at temperatures up to 1000°C.
There are 8 figures, 3 tables and 19 references, 12 of which are Slavic.

SUBMITTED: May 26, 1956.

ASSOCIATIONS: Ac.Sc. U.S.S.R. Institute of Physics of the Earth (Akademiya Nauk SSSR, Institut Fiziki Zemli) and Scientific Research Institute for Building Ceramics (N.-i. Institut Stroitel'noy Keramiki)

AVAILABLE: Library of Congress.

29485 S/035/61/000/009/009/036
A001/A101

3.5140

AUTHORS: Bovsheverov, V. M., Gurvich, A. S., Tatarskiy, V. I., Tsvang, L. R.

TITLE: Devices for statistical analysis of turbulence

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 9, 1961, 29, abstract 9A237 ("Tr. Soveshchaniya po issled. mertsaniya zvezd", 1958, Moscow-Leningrad, AN SSSR, 1959, 26-33, Discuss., 60-62)

TEXT: The laboratory of atmospheric acoustics of IFA, AS USSR, has constructed a set of devices for statistical analysis of turbulence in the Earth's atmosphere: 1) spectrum analyzer, designed on the principle of parallel storing of the signal on 30 filters located in the frequency range 0 05 - 1,000 cps with separation between the neighboring filters being half an octave (a special photoelectrical gage was developed for calibrating the analyzer), 2) an analyzer for measuring the function of probability distribution of light intensity fluctuations; it functions also on the principle of parallel storing and rapid consecutive inquiry (integrated distribution function is measured; the voltage being investigated is supplied to the modulator, further to 25 discriminators with different potentials of unlocking, and after amplification to the storing

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29485

Devices for statistical analysis of turbulence

S/035/61/000/009/009/036
A001/A101

elements; 3) correlation meter ("korrelometr") which represents a circuit for multiplying two voltages. To make the operation of the device more stable, the system has been selected in which each of the signals being multiplied acts upon different parameters of the output signal, the spacing and amplitude of the pulses. Block-diagrams of all devices are presented and principles of their operation are described. The equipment developed made it possible to obtain reliable material which calls, for final results, for comparatively little processing.

L. Zhukova

[Abstracter's note: Complete translation]

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89752

S/169/61/000/002/004/039
A005/A001

6.3000 (1138, 2801 only)

Translation from: Referativnyy zhurnal, Geofizika, 1961, No. 2, pp. 20-21, # 2B158

AUTHORS: Gurvich, A. S., Tatarskiy, V. I., Tsvang, L. R.

TITLE: The Scintillation of Terrestrial Light Sources

PERIODICAL: Tr. Soveshchaniya po issled. mertsaniya zvezd, 1958. Moscow-Leningrad, AN SSSR, 1959, pp. 33-46. Discuss., pp. 60-62

TEXT: Results are described of an experimental study of the fluctuations of the intensity of light J which propagates in the undermost layer of the atmosphere. Measurements of the functions of the distribution of fluctuation probabilities showed that the magnitude of J is distributed logarithmically normal. The experimental correlation

$$\sigma_J^2 = \overline{[\ln J - \ln J]^2} = f(L),$$

where L is the distance between the light source and the observation point, agrees well with the theoretical correlation $\sigma_J^2 \sim L^{11/6}$. The measured radii of the correlation of fluctuations J proved to be equal to $1.6\sqrt{\lambda L}$ (for values of $\sqrt{\lambda L}$ from 1.6 to 3.2 cm), which well agrees with the theory with an accuracy up to a

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A005/A001

The Scintillation of Terrestrial Light Sources

numerical factor. The experimental frequency spectra W(f) of the fluctuations J are well described by the expression $fw(f) = F\left(\frac{f\sqrt{\lambda L}}{v_\perp}\right)$, where $v_\perp$ is the component of the wind velocity perpendicular to the ray. The form of the function F is near the theoretical one, but differs from the latter by some details.

V. I. T.

Translator's note: This is the full translation of the original Russian abstract.

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GURVICH, A. S., TATARSKIY, V. I. and TSVANG, L. R.

"Experimental Study of Twinkling of a Light Source Situated on the Earth's Surface."

paper presented at the 4th All-Union Conference on Acoustics, Moscow, 26 May - 2 Jun 58.

AUTHOR: Gurvich, A.S. 72-58-6-11/19

TITLE: Elastic Tensions in Glazings in the Presence of an "Intermediate Layer" (Uprugiye napryazheniya v glazuryakh pri nalichii "promezhutochnogo sloya")

PERIODICAL: Steklo i Keramika, 1958, [illegible] Nr 6, pp. 37-39 (USSR)

ABSTRACT: In order to simplify calculation of tension the author assumes that a plate having a thickness of h_2 is concerned, which is covered with a glazing having a thickness of h_1, with $h_1 < h_2$. The first variant presupposes that in the interaction between glazing and body no noticeable intermediate layer is formed. It is further assumed that the plate does not buckle when cooled, which, however, might be taken into account on the strength of the works by V.P.Barzakovskiy and S.K.Dubrovo (Ref 1). Fig. 1 shows the elastic deformations in glazing and body by which the elastic tensions in them are caused. In accordance with the law by Khuk (S.P.Timoshenko) (Ref 2) the dependence between deformations and tensions can be determined by the formulae (2). By means of the formulae (5) the tensions in the glazing and in

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the body can be calculated. The author makes use of these formulae in order to determine the dependence of the amount of tensions in the glazing upon the thickness of the glazing layer and obtains the formula (7). From the latter it follows that with an increase of the thickness of the glazing layer tensions existing in it decrease, which is contrary to opinions hitherto held. The second variant is then investigated, viz. if an intermediate layer is formed between glazing and body as a result of interaction. The forming of an intermediate layer can be caused either by dissolution of the substance of the body by the glazing or by penetration of the glazing into the body, which depends on the burning temperature, on the critical interval, on chemical and mineralogical composition, as well as on other conditions (see scheme shown in fig. 2). Furthermore calculations of tension are carried out. In this way the author develops formula (10), which can be used for the purpose of comparing tensions in glazings with and without the presence of an intermediate layer. The author further says that in layers in which the composition of glazing and properties have not changed tensions remain unchanged no matter whether an intermediate layer exists or not. Interaction between glazing and body may both increase and decrease the difference of

Elastic Tensions in Glazings in the Presence of an "Intermediate Layer" 72-58-6-11/19

dilatation coefficients, which causes a decrease of tensions and an increase of elastic tensions respectively, as was found by Z.A.Nosova and M.Ye.Yakovleva (Ref 1). The results of experimental investigations which were published (L.S.Leybenzon) (Ref 1) confirmed the results obtained by the author in his calculations, in which connection reference is made also to the works by V.P.Barzakovskiy and S.K.Dubrovo. In order to reduce tensions in the glazing it is necessary, by choosing suitable composition and thickness of this layer, as well as a suitable method of burning, to cause modifications and changes to take place in the entire layer of glazing. There are 2 figures, and 5 references, 4 of which are Soviet.

ASSOCIATION: NIIstroykeramika (NII Building Ceramics)

1. Ceramic materials--Heat treatment 2. Ceramic materials--Stresses
3. Stress analysis

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3(7) SOV/33-35-4-11/25

AUTHORS: Tatarskiy, V.I., Gurvich, A.S., Kallistratova, M.A., Terent'yeva, L.V.

TITLE: The Influence of Meteorological Conditions on the Intensity of Light Scintillation Near the Surface of the Earth (O vliyanii meteorologicheskikh usloviy na intensivnost' mertsaniya sveta v prizemnom sloye atmosfery)

PERIODICAL: Astronomicheskiy zhurnal, 1958, Vol 35, Nr 4, pp 623-626(USSR)

ABSTRACT: The authors report on the experimental investigation of the dependence of scintillation of a source on the earth on the meteorological conditions. The observations have been carried out in autumn 1956 by an astrophysical expedition of the Institute for Atmospheric Physics, Academy of Science USSR. It was stated that the intensity of scintillation and the vertical gradient of the mean temperature strongly correlate (correlation coefficient 0.92) which shows a good coincidence with the theoretical results of the authors. The investigations have a provisional character and are to be continued.

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The Influence of Meteorological Conditions on the Intensity of Light Scintillation Near the Surface of the Earth SOV/33-35-4-11/25

There are 1 figure, and 14 references, 6 of which are Soviet, 5 American, and 3 English.

ASSOCIATION: Institut fiziki atmosfery AN SSSR (Institute of Atmospherical Physics AS USSR)

SUBMITTED: May 25, 1957

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24(4), 3(7) SOV/20-123-4-22/53

AUTHORS: Gurvich, A. S., Tatarskiy, V. I., Tsvang, L. R.

TITLE: Experimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light (Eksperimental'noye issledovaniye statisticheskikh kharakteristik mertsaniya nazemnogo istochnika sveta)

PERIODICAL: Doklady Akademii nauk SSSR, 1950, Vol 123, Nr 4, pp 655-658 (USSR)

ABSTRACT: If the fluctuation of the refraction index n of a medium obeys the "2/3-law"

$$\overline{\left[n(\vec{r}+\vec{\rho}) - n(\vec{r})\right]^2} = C_n^2 \rho^{2/3}$$

and the conditions $\lambda \ll l_o$, $\lambda^3 L \ll l_o^4$, $l_o \ll \sqrt{\lambda L} \ll L_o$, $C_n^2 L l_o^{-1/3} \ll 1$, the following conclusions may be drawn from the present theory. (C_n^2 denotes a constant quantity depending on grad $\bar{n}$ and on the characteristics of turbulence, l_o and L_o - the internal and external scales of turbulence respectively, λ - the wave length, L - the distance covered by the wave in the turbulent medium). 1) The intensity fluctuations of

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Experimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light

light are distributed according to a logarithmically normal law. 2) For the dispersion of the intensity I of the light wave the formula $\sigma^2 = \overline{\left[\ln I - \overline{\ln I}\right]^2} = 10.5\, C_n^2\, \lambda^{-7/6} L^{11/6}$ applies, and herefrom it follows that $\sigma^2 \sim L^{11/6}$. 3) The correlation function B_I of the fluctuations of the intensity logarithm of light in the plane which is vertical to the beam depends on $\varrho/\sqrt{\lambda L}$: $B_I = B_I\left(\frac{\varrho}{\sqrt{\lambda L}}\right)$.

Here ϱ denotes the distance between the points of observation and the correlation scale (masshtab korrelyatsii) is of the order $\sqrt{\lambda L}$. 4) A function is given for the fluctuation frequency spectrum. All these regularities were experimentally checked 1956-57 over a very flat area of the steppe in the Tsimlyansk district. Together with measurements of flickering, the mean temperature, the wind velocity in 0.5; 1; 2; 4; 8 and 12 m, and also the direction of the wind were measured.

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Experimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light

Measuring results: Ad 1) About 100 empirical distribution functions were investigated. They all show satisfactory agreement with the hypothesis of the logarithmically normal distribution law of I. By using this law it is possible to express the quantity σ^2 by experimentally observed quantity. Ad 2) The simplest method of reducing observation data to equal meteorological conditions is that of averaging all values of σ^2 obtained in the case of given L and different meteorological conditions. The dependence of the quantity σ^2 on the distance L corresponds satisfactorily to the theoretical relation $\sigma^2 \sim L^{11/6}$. Ad 3) In the case of varying L, the values of the correlation coefficient R agree well with one another. The results obtained by the present paper confirm the similarity law $R=R(\varrho/\sqrt{\lambda L'})$. Ad 4) About 80 frequency spectra were evaluated at L = 1000 m and L = 2000 m. Also the results obtained by these investigations supplied additional confirmation of the similarity law. Summarizingly, it may be said that the data obtained in the present paper agree satisfactorily with the initially formulated main conclusions of the theory. There are 4 figures, 1 table, and 15 Soviet references.

SOV/20-123-4-22/53

Exporimental Investigation of the Statistical Characteristics of the Scintillation of a Terrestrial Source of Light

ASSOCIATION: Institut fiziki atmosfery Akademii nauk SSSR
(Institute of the Physics of the Atmosphere of the Academy of Sciences, USSR)

PRESENTED: July 17, 1958, by N. N. Andreyev, Academician

SUBMITTED: July 17, 1958

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1. Following are titles and authors of some of the papers to be presented at subject Congress:

USSR

ANAN'YEVA, A. A., Acoustics Institute, USSR Academy of Sciences, Moscow - "Barium-titanate cylindrical transducer radiating along the axis"

ANDREYEV, N. N., Acoustics Institute, USSR Academy of Sciences, Moscow - "Some questions of non-linear acoustics"

BALIAN, S. A., and KUDRYAVTSEV, B. B., Laboratory for Molecular Acoustics, Moscow Oblast Institute for Pedagogics - "Sound dispersion in a liquid mixture, the components of which form a chemical compound"

CHISTOVICH, L., Pavlov Institute of Physiology, USSR Academy of Sciences, Leningrad - "Mutual masking of clicks following in rapid succession and their loudness discrimination"

GERSHUNI, Grigoriy V., Pavlov Institute of Physiology, USSR Academy of Sciences, Leningrad - "On the regulation of characteristics of the auditory system"

GOL'DBERG, G. A., Acoustics Institute, USSR Academy of Sciences, Moscow - "On the statistical reverberation theory"

GOLYAMINA, I. P., Acoustics Institute, USSR Academy of Sciences, Moscow - "Study of magnetically exact sound transformers from ferrites"

GURVICH, A. S., Institute of Physics of the Atmosphere, USSR Academy of Sciences, Moscow - "Acoustic microanemometer"

ILYASHUK, Yu. M., Laboratory for Combating Noise, Institute for Labor Protection, Leningrad - "Study of the dynamic characteristics of noise measurement devices and problems of standardizing them"

KALLISTRATOVA, M. A., Institute of Physics of the Atmosphere, USSR Academy of Sciences, Moscow - "Experimental investigation of sound scattering in the atmosphere"

KRASIL'NIKOV, V. A., and ZAREMBO, L. K., Acoustics Institute, USSR Academy of Sciences, Moscow - "Some questions of non-linear acoustics in liquids"

KUDRYAVTSEV, B. B., Laboratory for Molecular Acoustics, Moscow Oblast Institute for Pedagogics - "Sound dispersion in liquids"

Excerpts from the Program and Information Circular, reports to be submitted for the Third Intl. Congress on Acoustics, IUPAP, Stuttgart, GFR, 1-8 Sep 1959.

GURVICH, A.S.

PHASE I BOOK EXPLOITATION SOV/4867

Soveshchaniye po issledovaniyu mertsaniya zvezd, Moscow, 1958

Trudy Soveshchaniya po issledovaniyu mertsaniya zvezd, Moskva, 18-20 iyunya 1958 g. (Conference on the Study of Star Scintillation) Moscow, Izd-vo AN SSSR, 1959. Errata slip inserted. 1,000 copies printed.

PURPOSE: This book is intended for astronomers. It may be of interest to physicists studying the atmosphere and designers of astronomical equipment.

COVERAGE: The book reports on the Transactions of the Conference on the Study of Stellar Scintillation, held in Moscow from 18 to 23 June 1958. The Conference was organized by the Astronomical Council AS USSR and the Institute of Physics of the Atmosphere AS USSR. The book contains summaries of 23 reports read at the Conference, treating stellar scintillation and flickering of star images. Individual reports deal with methods and instruments of observation. Included are brief summaries of the discussions which followed each session, and the resolution adopted by the Conference. References follow individual articles.

Bovsheverov, V. M., A. S. Gurvich, V. I. Tatarskiy, and L. R. Tsvang [Institute of Physics of the Atmosphere AS USSR]. Instruments for the Statistical Analysis of Turbulence 26

Gurvich, A. S., V. I. Tatarskiy, and L. R. Tsvang. [Institute of Physics of the Atmosphere AS USSR]. Scintillation of Terrestrial Sources of Light 33

Chernov, L. A., and M. N. Krom. [Yaroslavskiy gosudarstvennyy pedagogicheskiy institut imeni K. D. Ushinskogo - Yaroslavl' State Pedagogical Institute imeni K. D. Ushinskiy]. Relationship Between the Diffractional Image in the Lens and the Magnitude of Incident Wave Fluctuation 47

Discussions:

Elyakhman, E. A. [Yaroslavl' State Pedagogical Institute imeni K. D. Ushinskiy]. The Effect of Diaphragm Size on the Mean Square Frequency of Field Pulsation at the Lens Focus 55

Tatarskiy, V. I. Some Remarks Concerning the Report of L. A. Chernov and M. N. Krom and the Address of E. A. Elyakhman 57

Krom, M. N. 60

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Mel'nikov, O. A. 61

MORNING SESSION, June 19th

Reports:

Mel'nikov, O. A., I. G. Kolchinskiy, and N. I. Kucherov. Scintillation and Flickering of Star Images. Astroclimate. (Review of Scientific Works) 63

Zhukova, L. N. [Glavnaya astronomicheskaya observatoriya AN SSSR - Main Astronomical Observatory AS USSR]. Observations of Stellar Scintillation Made at Pulkovo With the ASI-5 Telescope 115

Demidova, A. N. [Main Astronomical Observatory AS USSR]. Observations of Stellar Scintillation Made at Pulkovo With the AZT-7 Telescope 123

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A001/A101

3,5150

AUTHORS: Gurvich, A.S., Tatarskiy, V.I., Tsvang, L.R.

TITLE: Scintillation of ground light sources

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 10, 1961, 32, abstract 10A241 ("Tr. Soveshchaniya po issled. mertsaniya zvezd.", 1958, Moscow-Leningrad, AN SSSR, 1959, 33-46, Discuss., 60-62).

TEXT: Results of experiments for studying scintillation of a ground source (in the atmospheric layer near the ground) are described. Simultaneously with scintillations were measured fluctuations of refraction index, which makes it possible to compare more completely the theory with the observations. Conditions of conducting experiments are described. The main results of measuring the function of probability distribution of light intensity fluctuations are presented (the distribution is logarithmically normal). Moreover, the authors describe the results of determining the following relations: the dependence of scintillation magnitude on distance and meteorological conditions (the amplitude of scintillation increases with the vertical gradient of the average temperature); the correlation function of light intensity fluctuations in the plane perpendicular to

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Scintillation of ground light sources

the light beam (the theoretical conclusion is confirmed that the spatial correlation function depends on argument $\rho/\sqrt{\lambda L}$, where λ is wavelength, L is distance, and radius of fluctuation correlation is of the order $\sqrt{\lambda L}$) of the frequency spectrum of light intensity fluctuations. It is shown that the latter depends on argument $f\sqrt{\lambda L}/v_{\perp}$, where f is frequency, $v_{\perp}$ is wind velocity perpendicular to the line-of-sight.

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L. Zhukova

[Abstracter's note: Complete translation]

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SOV/46-5-3-17/32

3(7), 24(1)

AUTHOR: Gurvich, A.S.

TITLE: An Acoustic Micro-Anemometer for the Study of Microstructure of Turbulence (Akusticheskiy mikroanemometr dlya issledovaniya mikrostruktury turbulentnosti)

PERIODICAL: Akusticheskiy zhurnal, 1959, Vol 5, Nr 3, pp 368-369 (USSR)

ABSTRACT: The author used cylindrical condenser transducers of 2 mm diameter and 5 mm length as microphones and radiators. The moving electrode was in the form of a terylene film of 3.5 μ thickness metallized on its external side. The microphone sensitivity was 0.07-0.1 mV/bar at frequencies of 75-100 kc/s. The use of these miniature transducers made it possible to reduce the micro-anemometer base to 2.5 cm. The principle of action of the micro-anemometer is based on the dependence of the time required to propagate sound on the rate of motion of the medium. A fixed point source of sound and two point receivers are placed in such a way that the source is in the middle and the receivers are on two opposite sides of the source at distances l from it. The time interval t between the moments of reception at the two receivers is given by:

$$\Delta t = 2lv_l/(c_0^2 - v^2),$$

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An Acoustic Micro-Anemometer for the Study of Microstructure of Turbulence

where v is the velocity of motion of the medium, v_ℓ is projection of v in the direction ℓ and c_0 is the velocity of sound in a stationary medium. It is more convenient to measure the phase difference $\Delta\varphi = \omega\Delta t$ (ω is the angular frequency), since the phase difference can be measured more accurately than the time interval. The value of v_ℓ is then given by:

$$v_\ell = \frac{c_0^2 \Delta\varphi}{2\omega\ell}\left(1 - \frac{v^2}{c_0^2}\right). \qquad (1)$$

The v^2/c_0^2 term is less than 1% for $v < 30$ m/sec and can, therefore, be neglected in measurements near the ground. Eq (1) shows that the micro-anemometer does not require calibration since all the parameters which occur in Eq (1) can be measured directly. In accurate measurements it is necessary to allow for the fact that the base ℓ is different, because of diffraction, from the geometrical distance ℓ' between the radiator and the microphone (in the author's anemometer the value of $(\ell - \ell')/\ell'$ was less than 5%). In the deduction of Eq (1) the value of c_0 was assumed to be constant. In fact c_0 is not constant because of temperature

An Acoustic Micro-Anemometer for the Study of Microstructure of Turbulence

fluctuations and this leads to fluctuations in the micro-anemometer sensitivity. In measurements near the ground these sensitivity fluctuations lead to an error of the order of 10^{-3} and can, therefore, be neglected. A considerable error is introduced due to difference in temperature along the two paths of length ℓ. This can be avoided by having two sound waves propagated in two opposite directions along the same path. For this purpose two radiators and two microphones are placed at two ends of a base length ℓ. Two different but coherent frequencies are employed in this case. The anemometer circuit is shown schematically in Fig 1. A quartz oscillator 1 working at 150 kc/s excites two small frequency transformers (2, 3) which produce coherent signals of frequencies 75 kc/s and 100 kc/s respectively. Radiators 4 and 5 and microphones 6 and 7 are fixed in the probes of a special head shown in Fig 2. Amplifiers 8 and 9 feed the signals to frequency multipliers 10 and 11 where the frequencies are multiplied by 8 and 6 respectively. The signals leaving the multipliers have the same frequency of 600 kc/s and they are fed to frequency mixers 12 and 13 to which a 602 kc/s signal is fed from a separate heterodyne source. 2 kc/s signals from the frequency shifters pass through a phase shifter 15 to a start-stop phase-meter 16.

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The output signal of the phase-meter is proportional to the difference of the phase between the signals, i.e. to the value of v_t. The sensitivity of the instrument is 9 cm/sec per volt and the total deflection amounts to ±2 m/sec. The zero drift is less than 1 cm/sec per 20 min and the noise background is less than 1 cm/sec. The micro-anemometer was used successfully to measure the vertical component of wind velocity near the ground. There are 2 figures and 5 references, 2 of which are Soviet and 3 English.

ASSOCIATION: Institut fiziki atmosfery, AN SSSR, Moskva (Atmospheric Physics Institute, Ac. Sc. USSR, Moscow)

SUBMITTED: January 3, 1959